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EXAMINER	
PHAN, THIEM D	

ART UNIT	PAPER NUMBER
3729	

DATE MAILED: 02/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/041,935	KOBAYASHI, YUKIHISA	
	Examiner	Art Unit	
	Tim Phan	3729	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 November 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *15,16,21-23,25-32 and 35-39* is/are pending in the application.

4a) Of the above claim(s) *35 and 39* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) *15,16,21-23,25-32,36-38* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. The amendment filed on 11/23/05 has been fully considered and made of record.

Election/Restrictions

2. Applicant's Amendment (filed 11/23/05) has added new claims (Claims 36-39) and new embodiments, which then necessitate new grounds of Restriction presented in this Office action.

Restriction to one of the following inventions is required under 35 U. S. C. 121:

I. Claims 15, 16, 21-23, 25-32 and 36-38, drawn to a method of manufacturing a circuit board, classified in class 29, subclass 840;

II. Claims 35 and 39, drawn to a method of manufacturing a display device, classified in class 29, subclass 832.

3. The inventions are distinct, each from the other because of the following reasons: Inventions I and II are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as

claimed because the method of manufacturing a circuit board as recited in Group I does not require a panel display thereof, as required by Group II. The subcombination, Invention II, has separate utility such as making a display device.

4. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group II, restriction for examination purposes as indicated is proper.

5. Since applicant has received an action on the merits for the originally presented or claimed invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 35 and 39 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Applicant is required to cancel these nonelected claims (35 and 39) or take other appropriate action.

An Office Action on the merits of Claims 15, 16, 21-23, 25-32 and 36-38 now follows.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 15, 16, 21-23 and 25-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uchiyama (US 6,265,770 B1) in view of Uchiyama et al (US 5,847,796) or vice versa.

As applied to claim 15, Uchiyama teaches a process of mounting a semiconductor component on a substrate (Abstract), comprising:

- a step of mounting a first component (Fig. 1, 2) within a first region (Fig. 1, area of 2) on a substrate (Fig. 1, 3) by solder connection (Col. 5, lines 20 ff.);
- a step of arranging an anisotropic conductive film (Fig. 1, 4) within a band region (Fig. 1, surround of A) of the substrate (Fig. 1, 3);
- a step of arranging a second component (Fig. 1, 6) on the anisotropic conductive film (Fig. 1, 4); and
- a step of thermocompression-bonding (Col. 5, lines 56 ff.) the second component (Fig. 1, 6) within a second region (Fig. 1, A) on the substrate (Fig. 1, 3) with said anisotropic conductive film (Fig. 1, 4) held therebetween;
- wherein said step of arranging said anisotropic conductive film within said band region of

said substrate (Fig. 1, top surface of 3) is performed after said step of mounting the first component on said substrate by the solder connection.

Uchiyama et al teach a method of bonding a driver IC (Fig. 3, 1) with a bonding tool or compression bonding head (Fig. 3, 4), slightly wider than the driver IC but much smaller than a band region or upper surface of the substrate (Fig. 3, 62) in order to have a more uniform load at a more uniform temperature of bonding.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the two teachings by applying the bonding tool or compression bonding head, as taught by the Uchiyama et al, to the IC mounting process of Uchiyama, in order to have a more uniform load at a more uniform temperature of bonding. The limitations of the claim "...the band region extending from the second region toward ... surface of the head." are considered to be of a claimed article wherein the process for mounting semiconductor chips operates so this manner of operation does not distinguish over the process of Uchiyama in view of Uchiyama et al; and Uchiyama in view of Uchiyama et al at a minimum suggest the claimed method invention.

As applied to claim 16, Uchiyama teaches a process of mounting a semiconductor component on a substrate, which reads on applicant's claimed invention, except for mounting the first component (Fig. 1, 2) on the substrate (Fig. 1, 3) by the solder connection such as a reflow treatment.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to solder (Col. 5, lines 20 ff) the connection by reflow treatment, which is well known in order to increase production.

As applied to claim 21, Uchiyama teaches a process of mounting a semiconductor component on a substrate (Abstract), where the I/O terminals (Fig. 1, 11 & 12) are disposed along the edge of the substrate or circuit board, comprising:

a.) selecting a band region of a surface of the substrate (Fig. 1, surround of A) of the circuit board or substrate (Fig. 1, 3);

b.) soldering a first component (Fig. 1, 2; Col. 5, lines 20 ff.) onto the circuit board (Fig. 1, 3) in a first region (Fig. 1, area of 2) outside of the band region (Fig. 1, surround of A); and

c.) after step b.) where the first component (Fig. 1, 2) is soldered (Fig. 1, 1; Col. 5, lines 20 ff.) to the substrate (Fig. 1, 3), mounting a second component (Fig. 1, 6) on the substrate or circuit board (Fig. 1, 3) within a second region (Fig. 1, A) located within the band region (Fig. 1, surround of A) with an anisotropic conductive film (Fig. 1, 4).

Uchiyama et al teach a method of bonding a driver IC (Fig. 3, 1) with a bonding tool or compression bonding head (Fig. 3, 4), slightly wider than the driver IC but much smaller than a band region or upper surface of the substrate (Fig. 3, 62) in order to have a more uniform load at a more uniform temperature of bonding.

It would have been obvious to one of ordinary skill in the art at the time the invention

was made to combine the two teachings by applying the bonding tool or compression bonding head, as taught by Uchiyama et al, to the IC mounting process of Uchiyama, in order to have a more uniform load at a more uniform temperature of bonding. The limitations of the claim "...the band region extending from the second region toward ... surface of the head." are considered to be of a claimed article wherein the process for mounting semiconductor chips operates so this manner of operation does not distinguish over the process of Uchiyama in view of Uchiyama et al; and Uchiyama in view of Uchiyama et al at a minimum suggest the claimed method invention.

As applied to claim 22, Uchiyama et al and Uchiyama teach the claimed invention, including the thermal press-bonding (Uchiyama, Col. 5, lines 57 ff.) and a heated bonding head or bonding tool (Uchiyama et al, Fig. 10, 4) pressing against the component (Uchiyama et al, Fig. 10, 1).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have a heated bonding head pressing against the component (Uchiyama et al, Fig. 10, 1) in selected area (Uchiyama, Fig. 1, surround of A) without hitting the first component (Uchiyama, Fig. 1, 2) in order concentrate all the heat toward melting the anisotropic conductive film (Uchiyama, Fig. 1, 4) under the chip (Uchiyama, Fig. 1, 6).

As applied to claims 23 and 28, Uchiyama teaches that the first component (Fig. 1, 2) is selected from the group of passive and mechanical components (Col. 5, lines 15 ff.), and the

second component comprises a semiconductor device (Fig. 1, 6; col. 11, line 37) or LCD or power source IC.

As applied to claim 25, Uchiyama teaches the claimed invention, except for providing the alignment marks outside the band region (Fig. 1, surround of A).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the alignment marks outside the band region since it was known in the art that reference marks are utilized to assign an exact location of a band region (Fig. 1, A).

As applied to claim 26, Uchiyama teaches that a bonding region by ACF or band region is selected or set aside (Fig. 1, surround of A) when the first components are soldered (Col. 5, lines 20 ff.) to the substrate by conventional technique such as solder reflow.

As applied to claim 27, Uchiyama teaches that the band region (Fig. 1, surround of A) divides a first set of first components (Fig. 1, left set of 2) on one part of the substrate and a second set of first components (Fig. 1, right set of 2) on a second part of the substrate (Fig. 1, 3).

As applied to claim 29, Uchiyama teaches that the band region (Fig. 1, surround of A) can be extended from one end to the other end of the substrate (Fig. 1, 3).

As applied to claim 30, Uchiyama teaches that the band region (Fig. 1, surround of A) extends rectilinearly along the substrate (Fig. 1, 3).

As applied to claim 31, Uchiyama teaches that there are wiring patterns (Fig. 1, 11) on the substrate (Fig. 1, 3) in the band region (Fig. 1, surround of A).

As applied to claim 32, Uchiyama teaches a dummy electrode or ground wire (Fig. 1, 12) at a position associated with the second component or LCD chip (Fig. 1, 6).

As applied to claim 36, Uchiyama teaches the mounting of another first component (Fig. 1, 2/right set) in another first region (Fig. 1, area around 2/right set), where the first region (Fig. 1, area around 2/left set) and the another first region are disposed on opposing sides of the band region (Fig. 1, surround of A) such that the band region extends between the first regions toward the output side terminal (Fig. 1, 11 or 12).

As applied to claim 37, Uchiyama teaches that the band region (Fig. 1, surround of A) is narrower than a surface of the circuit board or substrate (Fig. 1, 3).

As applied to claim 38, Uchiyama teaches the mounting of another first component (Fig. 1, some of 2/right set) in another first region (Fig. 1, area around some of 2/right set) outside of the band region (Fig. 1, surround of A), the another first region being disposed on the surface of the circuit board or substrate (Fig. 1, 3) on a side of circuit board that opposes the first region (Fig. 1, area around 2/left set).

Response to Arguments

Applicant's arguments with respect to claims 15, 16, 21-23, 25-32 and 36-38 have been considered but are moot in view of the new grounds of rejection.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Applicant's amendment necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tim Phan whose telephone number is 571-272-4568. The examiner can normally be reached on M - F, 9AM - 5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Vo can be reached on 571-272-4690. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tim Phan
Examiner
Art Unit 3729

A. DEXTER TUGBANG
PRIMARY EXAMINER

tp
January 27, 2006